SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

BIRMINGHAM, AND THE BLACK COUNTRY—No. II.

THE EARL OF DUDLEY'S WORKS.

In our last article we briefly sketched the history of the manufacture of iron, and spoke of the invention of Dud Dudley, at the time remarking that he was of the same family as the present Earl. We have now chosen the works of the latter as the first for illustration, as his is the model establishment of South Staffordshire, and from it is produced some of the best iron in the world. The Round Oak Ironworks are situated at Brierley Hill, about two miles from Dudley, close to the side of the Great Western Railway, and have the canal at their rear, so that they are well situated as far as regards means for transit of material. Perhaps it would be as well here to give an account of the Earl's connection with Dudley, and his reason for erecting the Round Oak Works. Almost the whole of the land and minerals lying within a circle of five miles around Dudley are the property of the Earl, and under the control of his head agent, whose residence and offices are at the Priory, Dudley. The whole of the space mentioned is extremely rich in the raw material of which iron is made—perhaps, more so than any other spot on the earth's surface; but of the geological structure we shall speak in another article—but the resources of this vast estate were never to any great extent developed until the time of the late agent, Mr. Richard Smith. This gentleman was ably supported by his son, Mr. Frederick Smith, who at the retirement of his father took the reins, and carried on the great work, and by Mr. Fisher Smith, the agent for the east side of Dudley. The name of Smith will ever be historically connected with the iron trade of South Staffordshire, for not only by the Smiths has a considerable portion of the rich treasures buried low in the bowels of the centre portion of this wonderful little island of ours been discovered and brought to the surface, but these they have formed into a substance, which has saved the reputation of Staffordshire, and gone forth to every portion of the globe, showing the world that this country has the material, industry, and skill wherewith to make iron that defies competition. The object in building the Round Oak Works was not to use the great advantages of the Earl so as to make iron that would push the produce of other neighbouring ironmasters out of the market, but to make it of a quality never before equalled, and such as would be suitable for certain purposes. In proof of this, we may say that the Earl's iron is always above the list prices. Another main reason for the erection of these works was that the large quantity of minerals raised from this estate might be reduced to such a form as to render them marketable in places where it would be impossible to dispose of the raw material. This district is a vast source of wealth to the Earl of Dudley, and this fact he always keeps in view, as is clear from the many munificent gifts he has bestowed upon Dudley and its environs. At some future time, should space permit, we may notice these.

The architecture of the Round Oak Works is everything that could be desired; they are not only of a fine appearance, such as is seldom or ever seen in the Black Country, but are built in a manner that is best suited to the laying out of the internal machinery. The centre portion is occupied by two forges, and on each side of these are the mills; in close proximity to the mills are two extensive warehouses for the stocking of the finished iron, and these warehouses form the extremities of the front of the works. They are built in a very substantial manner of red bricks faced with white, and the eaves of the slated roofs are terminated by cast-iron spouting of a very handsome patern. The boiler-houses, three in number, having the three large stacks in front of them, are at the back, and the whole of the body of the works is covered by a series of slated roofs, supported upon ornamental cast-iron columns. In the centre of the front of the works is a neat little building used as the timekeeper's office. In describing the machinery, the forges first come under notice. The main driving engine is horizontal, having a 30-in. cylinder, and works a 3-ft. stroke; this sets in motion two forge trains, two helves, and two pair of shears. The fly-wheel of the engine is 20 ft. diameter, and upon its shaft there is a 6 ft. driving pinion and a 5 ft. 7 in. flat pulley; the former drives what is called No. 2 forge machinery, and the latter No. 1. No. 1 forge has a strong 10-in. flat rope working from the before-mentioned on to a 20-ft. pulley, which is blocked and keyed on to the cam-ring shaft; the cam-ring lifts four times in a revolution a 6½-ton helve, under which the puddled balls are shingled. No. 2 forge machinery consists of a 16-ft. spur wheel working into the above driving pinion; the spur wheel is on an intermediate shaft, and works a 25-ft. spur wheel fixed on to the cam shaft, which works a similar cam-ring and helve to No. 1. To these two sets of machinery there are all the necessary sill-plates, carriages, and brasses, standards, chocks, and harness, blocks, cups, hammers, and anvils, and the whole is fastened to strong oak and elm foundations. The two forge trains, consisting of three sets of rolls each, work one off either end of the intermediate shaft. At the end of the forge machinery, at the back of the timekeeper's office, stands a 4-ton Kirkstall Forge Company's steam-hammer. The two pair of shears are worked from the engine by underground shafting, but independently of these there are two other pairs, worked by a small vertical engine, and all are engaged cutting down puddled bars for the mills. The boilers at the back of the engine are of the cylindrical or wagon type, and five in number; they are each 30 ft. long by 5 ft. diam. In the two forges there are 27 puddling and 2 ball furnaces.

To the left of the forges at the top end of the works is an horizontal engine of the same size and in every respect similar to the one in the forges, and the plate-mill and 16-in. mill are driven from it. The plate-mill is worked from the engine by means of a 6-feet pinion on the fly-shaft, and a 16-feet spur-wheel on a driving-shaft. There are three pairs of rolls in this mill, the top ones are worked by friction, and lifted by balances. Three furnaces heat the piles, there is also one large annealing furnaces. The plate shears, worked by underground lever, are very powerful. The 16-in. mill, in which rails, angles, tees, and the heavier descriptions of iron are made, is driven from the end of the fly-wheel shaft. There are three pairs of rolls, with all the necessary housing, pinions, crabs, breaking spindles, coupling boxes, chocks, &c. There are three heating furnaces, one pair of shears, and one Smith's steam-saw. The latter machine stands upon a very small area, but with it can be cut round or square iron up to about 7 inches diameter. The exhaust steam from this saw heats the finished iron warehouse, and prevents the iron, stocked there, oxidising. On the right-hand side of the forges there is a vertical engine, having a cylinder 24-inch diameter, and working a 2-ft. stroke; from this are driven two mills, 12-inch and 8-inch. There are three sets of rolls to each of the mills, and the 8-inch mill is three rolls high. Steam is supplied to the engine from four cylindrical boilers, 30 ft. long by 5 ft. diameter. Four furnaces, two to each, heat the piles for these mills. A small Smith's steam saw cuts the ends of the bars from the larger mill, and a pair of cropping shears answer the same purpose in the smaller. The steam from this saw heats the warehouse at this end of the works in the manner before described. In a line with the 8-inch is a 7-inch mill, driven by an horizontal engine, with a 20-inch cylinder, working a 3-ft. stroke; a small hoop mill is also attached to this engine. The rolls are three high in the 7-inch mill. There are two heating furnaces and one pair of cropping shears connected with these mills. The steam for the engine is supplied by one firing boiler, and two others placed over the mill furnaces, the waste heat from which answers the same purpose as fires.

At the rear of the works there is a large lathe-house, containing two massive roll lathes, in which all the rolls are turned. The small horizontal engine used for the lathes also works four pumps, which raise the water into an extensive tank on the top of the lathe-house, from whence it supplies all parts of the works. The carpenters' shop is immediately under this tank, and over the lathes. The blacksmiths' shop adjoins the above building, and in this all the furnace tools, &c., are made and repaired. The yard in which the pig-iron is broken and sorted is on a line with the blacksmiths' shop. An hydraulic lift is placed in the pig-yard for raising iron from boats in the canal, which is below the level of the works. A small incline goes down in another part to a covered wharf, from which the finished iron, taken away by boat, is loaded. The roll store stands at the back of the works; it is a large building, and so well arranged that any pair of rolls needed can be brought into the works at a few minutes' notice. We must leave the remainder of the description of these works until next week.

IRONWORKS AND COLLIERIES IN YORKSHIRE.

THE NORMANTON IRONWORKS—PATENT IRON AND STEEL-PILED RAILS, ETC.—AND PUDDLING-FURNACES.

The extensive ironworks at Normanton, about four miles from Wakefield, are well known for the production of rails and railway material, as well as other descriptions of manufactured iron. They are situate close to the line of railway, and there is also canal accommodation to Hull and other places. There is a 22-in. train rail-mill, the production being about 500 tons per week, and a 12-in. merchant mill. There is an 80-horse power engine for the rail-mill, and one of the same power for the forge. The boilers are of the usual sort, as are also the ordinary appliances. There are 18 puddling-furnaces, a 7-ton hammer, and two shingling-hammers. The manager, Mr. Griffiths, is the patentee of a puddling-machine, which has been adopted at several places, and can be seen in operation at the works at Normanton. Like most important inventions, it is characterised by great simplicity, and the economising of manual labour. Mr. Griffiths informed us that he intended having the "balling" done in connection with the patent puddling-machine, and so dispensing with a great deal of labour. By the patent process, the same motion is given to the metal as by the ordinary hand method, and is effected with very little manual labour. On the top of the furnace-plates two cross-bars are fixed, which support a circular bed-plate over the arch of the furnace, and which also supports a vertical shaft. The lower end of the latter is connected with a horizontal shaft that carries a pulley, by which rotary motion is given to both shafts. There is a movable plate on the vertical shaft, to which a jib is fixed, set about midway between a vertical and horizontal position, and projects about 18 in. beyond the furnace door. To the projecting end of the jib a bar or hanger is suspended, the lower end being jointed to the puddling-tool or rubble. At the top of the vertical shaft is a crank, and a horizontal connecting-rod from it is jointed to the hanger about 2 ft. from the point where it is suspended from the jib, whilst a bevel toothed-wheel is fixed on the shaft, a short distance below the crank, and which gears with another bevel toothed-wheel of larger diameter. The latter wheel is fixed on the end of a horizontal shaft, working in bearings on the movable plate, and on the other end of the shaft is a pinion, which works into a hollow curved rack, of the form of a quadrant, fixed to the cross-bars which carry the machine. An opening is formed in the rack, through nearly its whole length, both the upper and lower edges of the opening being provided with teeth. The pinion, in traversing the rack, passes first along its lower edge, up the end, and returns along the upper edge, down the other end to the bottom, and so on, the pinion being guided by a plate placed between the upper and lower rows of teeth, and by that means the rotary motion of the shaft is made to communicate a reciprocating motion to the movable plate. By the action of the machine motion is given to the vertical shaft, the puddling-tool is worked backwards and forwards across the furnace by means of the crank and connecting-rod. The pinion working in the double quadrant rack gives a reciprocating motion to the movable plate and to the jib carried by it, so that by the combined motions the puddling-tool is caused to travel up and down and across the furnace, so that the iron is stirred much in the same way as by the ordinary method of manual operation. By Mr. Griffiths' process an increased quantity of iron, and of a better quality, is produced than by the old system, whilst the machine can be applied to the ordinary furnaces at a comparatively small cost. By it, we were informed by Mr. Griffiths, that in a turn of five heats, 3 tons 8 cwts. of iron will be produced, whilst by hand about 23 or 24 cwts. is the result of a turn, s that there is a saving effected of two-thirds of skilled labour and one-third of unskilled.

Mr. Griffiths's patent for piling iron and steel for rails, axles, &c., although as yet we believe not adopted by any of our railways, appears a really valuable invention, seeing that Bessemer rails are now considered more economical than iron, more especially where the traffic is very heavy. Seeing that one part only of the steel rail is really touched or worn, there does not appear any reason why the bottom part should not be made of the less valuable metal, as by so doing a very great saving would be effected. A section of the patent rail which we were shown by Mr. Griffiths certainly appeared to combine the tenacity of the Bessemer rail on that part which is of actual service with the cheapness caused by the greater part being made of iron. The iron is dovetailed to the steel, so that there is no fear of their separating. By the arrangement, the exterior of the pile is made of four bars or plates, the top and bottom ones overhanging or embracing the side bars, and holding them in their places. The inner faces of the overhanging edges of the top and bottom bars are inclined, and the edges of the side bars are also inclined, so as to fit against the inclined faces of the top and bottom bars, and so form what is known as a scarf-joint. The interior of the box or case of the pile thus formed is filled with bars or scrap, being arranged to suit the article to be made whether wholly of iron or steel. The pile is made hollow in the middle, so that the interior becomes heated nearly as soon as the exterior, whilst the steel is exposed as short a time as possible to the action of the fire. When the pile is required to be externally of steel and internally of iron, the hollow box or case is made of steel, and filled with bars or scrap iron. When two opposite faces only of the pile require to be made of steel then the top and bottom bars are made of steel and the side bars of iron, and the bars in the interior of the pile are placed upright, so that their edges, and not their flat faces, shall be presented to the top and bottom of the outer steel bars. When only one face of the pile is required to be made of steel, then only the top or bottom outer bars of the pile are made of steel. When either the top and bottom outer bars are made of steel, or only one of them of that material, the bar or bars are rolled with a projecting rib extending along the middle of the inner side, and the pile so constructed (as the rib extends into but does not fill up the space in the middle of the pile) is hollow, and more readily and uniformly heated preparatory to welding, whilst the rib or ribs secure the more effectual welding of the steel to the iron by giving a greater surface for conversion. Or the bottom and sides of the pile can be made of a bar of iron or steel rolled of a trough or channel form, the interior of the trough or channel being filled with bars or scrap, or the pile can be made of a double trough or channel, composed of two or more bars connected together by scarf-joints, the channels or either side of the central part of the double trough being filled with scraps or bars. For a pile for making girders, bars are made with projections on their ends, from which the flanges of the girders are made, then the bottom, top, and sides of the pile are made of the bars joined together by scarf-joints, and the interior of the pile is filled with bars of iron or scrap.

The invention appears to be one that cannot fail to recommend itself to those companies who at present patronise the Bessemer rail, seeing that they can obtain all the advantages of that material to their full extent, but at a very much less cost than hitherto.

COLLIERY WORKINGS IN NORTHUMBERLAND—No. I.

The Bedlington Coal Company's collieries comprise the Barrington, West Sleekburn, Bedlington A pits, and the Doctor pit, which are under the management of Mr. John Middleton. These four collieries have very extensive royalties attached to them; they are situated in the heart of the celebrated steam coal district of Northumberland. The extraordinary and increasing demand which has arisen for this class of coal for inland and marine purposes within the last 30 years has caused a corresponding development of the mineral treasures of this district; the supply is at present exclusively obtained from the Low Main seam, but other seams found lying above this in succession upwards—the Five-quarter, Yard, and High Main seams—all produce steam coal, though of inferior quality to the Low Main coal. Other seams of coal are confidently expected to be found below the latter, but the strata underneath are as yet unproved in the Bedlington Collieries. A change in the character of the coal seams occurs at the line of the 90 fathom dyke, which passes through this coal field from east to west, from the sea at Whitley to Backworth and Gosforth Collieries. The Low Main and other steam coals lying on the north side of this dyke are found to be totally changed immediately on the south side of it, assuming here the household character, the Low Main seam on the north side being identical with the well-known Hutton seam house coal of the North Durham district. In point of quality, the Low Main steam coal is unsurpassed in its evaporative power; recent improvements in furnaces specially adapting its burning for marine boilers have reduced the production of smoke to a minimum, and rendered it the most valuable steam fuel for long voyages. The Low Main seam averages 5½ ft. in thickness of clean coal at the Bedlington Collieries; there is but a slight production of fire-damp from the coal at the upper part of the properties; in the West Sleekburn property (the deeper part) this is more freely emitted. The coal is worked entirely on the bord and pillar system, the pillars being made 30 by 14 to 18 yards, the bords 4 to 5 yards, and the cross-holings or walls 2 yards in width. The pillars are worked off from each wall in lifts, meeting at the middle; the entire breadth of the pillar—18 yards—is taken at once. Candles are used in the whole working at these collieries: lamps in pillar working at West Sleekburn, but only partially in pillar working at the three other collieries. The ventilation of the Bedlington Mines is effected by the agency of furnaces and the upcast column. The amount of air in circulation in West Sleekburn Mine alone is 130,000 cubic feet per minute; in the other mines a much smaller quantity suffices to dilute the escaping gases.

Barrington Colliery.—This has been about 19 years in operation. The depth is 93 fms. to the Low Main seam. The downcast and coal pit is 12 ft. in diameter, another pit at the back of the engine-house is the upcast, which gives this colliery an independent ventilation. The great featnre at this establishment is the iron erections at the coal pit—no wood is used in the construction, and, as a whole, they are a model of neatness and good arrangement. The erections were put up by the firm of Hawks, Crawshay, and Co., from designs by Mr. John Short, the colliery engineer. There are nine coal screens, and an inclined elevator to the nut-screen; the platform is 24 feet above the railways. The screens, elevator, pulley-framing, girders, and plates for the platform, gangway, and roofing, are all of wrought-iron; the latter is covered with slate; the platform is enclosed at the sides by galvanised sheet-iron, coated with metallic paint. The columns for the screens and platform are of cast-iron; the screen-bars are of steel. The iron erections are calculated to be double the cost of wood, and to endure for 100 years or more. The winding-engine, with wrought-iron levers, has a 40-inch cylinder, covered,

6-ft. stroke, non-condensing; 17½-ft. cylindrical drum for 4¾-inch round wire-ropes. Fly-wheel 24 ft. in diameter; the break-strap goes round the whole circumference. A steam-break, with 12-inch cylinder, is fixed, and will be worked instead of a foot-break. The house is built entirely of Ashlar stone. The intermediate support of the drum is constructed wholly of wrought-iron girders and cast-iron columns from the floor level. The engine was made at the works of Bell, Goodman, and Co., Walker, 1870. Five boilers supply this and two small engines; each boiler, 40 ft. by 6 ft., plain cylindrical, is fired by Juckes's revolving grate. Steam-pressure, 28 lbs.; chimney octagonal, 105 ft. in the flue height, 8 ft. in width. Each boiler is fitted with two safety-valves, two floats, and one Hopkinson's valve. The cages are single-decked, two 9½-cwt. tubs in each. Each cage runs on two rails as conductors at one side of it; the rails are the same as the ordinary flanged rail, and weigh 40 lbs. per yard. The engine at present raises about 500 tons of coal per day, but this quantity can be greatly increased. A horizontal engine, with 10-in. cylinder, feeds the boiler and drives the grates. A hauling-engine at the top of the pit, with one 12-in. horizontal cylinder, 18 in. stroke, wheels in ratio of 1 to 4, and one drum 4 ft. in diameter, hauls on a bank in the Low Main of 500 yards in length, the bank head being 200 yards from the pit; the rope passes down the upcast pit. Another drum 5 ft. in diameter, used in repairing the shaft, can be connected to the engine.

BRICK WORKS.—Bricks are made from surface clay, moulded by machinery on Porter's patent. The clay is mixed in a horizontal double pug-mill, passes from thence between two rolls and through the die, when the clay is cut into the proper size by wires worked by hand. About 10,000 or more are moulded per day. The machinery is driven by a vibrating beam engine, 14-in. cylinder, 3-ft. stroke, by means of two belts. Part of the bricks are pressed by hand press. One brick is pressed alternately in two moulds by a rack and pinion motion. A drum may be connected to the engine, by which materials are raised up an inclined bank to the Barrington pit, or lowered down by means of a rope passed over a sheave at the top of the bank. The drying shed is heated by ten fires at one end, and communicating with two chimnies. There are six kilns, and chimney to each.

WEST SLEEKBURN COLLIERY.—This colliery has been seven years in operation. Both winding and pumping engines are erected here. Two pits are sunk to the Low Main seam, 118 fms. in depth. The downcast, 15 ft. in diameter, is in front of the pumping-engine, and is used for coal work and pumps, divided by brattice. The upcast, 10 ft. in diameter, at the back of the pumping-engine, is also used for pumps. The beam condensing pumping-engine has 64-in. cylinder, 7-ft. stroke; two bucket lifts from the Low Main, the lower lift 18-in. bucket, 7-ft. stroke, 57 fms. in height in the fore pit. The upper, a double lift, two 12½-in. buckets, 9-ft. stroke, and 67 and 69 fms. in height respectively in the back pit. The beam is extended over the cylinder, making the stroke in the pits unequal, but the quantity of water raised in each lift is equivalent. Winding-engine, lever, and condensing, 52-in. cylinder, 6-ft. stroke, 19-ft. cylindrical drum for round wire-ropes; fly-wheel, 21 ft. in diameter, with foot break, acting on under half of circumference. About 1100 tons of coal raised per day by this engine with two-decked cages, four 10-cwt. tubs in each cage. Eight plain boilers, 40 ft. by 6 ft., supply both engines at 15 lbs. steam pressure; these are fired by Juckes's grates. A 12-in. horizontal trunk engine feeds the boiler and works the firing apparatus. A 14-in. horizontal engine with two drums is used for pump work; one drum is nsed as a crab, the other as a jack for the men. One boiler, 20 ft. by 5 ft., for this engine, hand fired. Fourteen coal screens of wrought-iron are erected here, supported by cast-iron columns; but the heapstead or platform, pulley framing, inclined elevator to the nut screen and gangways are all constructed of wood; the flooring plates are cast-iron.

BEDLINGTON A PITS.—These have been thirty years in operation. Three pits are sunk to the Low Main seam, 99 fms. in depth, all downcasts; two of these are coal pits, 7 ft. in diameter, close together, one cage working in each; the third pit is 8 ft. in diameter, and, in conjunction with a staple, is used for the pumps. Beam condensing double acting pumping-engine has 65-in. cylinder, 7½-ft. stroke; it raises water in two bucket-lifts from the Low Main seam; the lower lift in the pump-shaft has 15½-in. bucket, 7½-ft. stroke, 59 fms. in height; the upper lift, in an 8-ft. staple at the opposite end of the house—the cylinder end of the beam projecting over to the staple—has 13½-in. bucket, 9-ft. stroke, 46½ fms. in height. This class of engines work with steadiness, and this and the West Sleekburn engine are capable of making 10 strokes per minute. The A pit winding-engine, lever and condensing, has a 47-in. cylinder, 5-ft. stroke, 14-ft. cylindrical drum, 20-ft. fly-wheel, with foot-break; these are supported by intermediate cast-iron framing; it raises about 500 tons of coal per day, with two-decked cages, four 7½-cwt. tubs in each cage; each cage runs on two wooden conductors. Six plain boilers supply these engines with steam; three of these, 8 ft. in diameter, supply the pumping-engine at 7 lbs. pressure; three others, 6 ft. in diameter, supply the winding-engine at 15 lbs. pressure. The boilers are fired by hand, and enclosed in a shed. The screens, platform, inclined elevator, and pulley frame are all constructed of wood.

WORKSHOPS.—These have recently been built on an extensive scale, adjacent to the Bedlington Colliery, extending along two sides of the yard. One range comprises shoeing, joiners, and saddlers' shops, storehouse, and 22-stalled stable: these buildings are 40 ft. in width. Another range comprises iron store, smiths' and fitting shops, engine shed, and saw-mills; these buildings are 44 ft. in width. The smiths' shop contains 12 fires, blown with fan-blast, one combined punching and shearing machine, and one screwing machine. The fitting shop contains two lathes, and two drilling machines. An engine, with two 20-in. horizontal cylinders, is in process of being made here for underground hauling in the Barrington pit, on the endless chain system. The sawing machinery consists of two circular saws, with 40-ft. travelling benches, moved by two belts from the engine, and one cross-cut saw. The fan is driven by two belts from the engine, at the rate of 1400 revolutions per minute. The machinery is driven by an engine of two 12-in. horizontal cylinders, 2-ft. stroke, supplied from two boilers, which are fired by Juckes's revolving grates. Above the sawing shed extensive granaries, in two stories, are built, each 180 ft. in length, 44 ft. in breadth. In the upper storey the grain in the whole state is deposited, consisting of oats, beans, peas, and maize; these are crushed in two mills as they are delivered to the lower storey, to be used in mixture for horses' food. About 230 horses and small ponies are employed underground in the Bedlington Collieries, which necessitates a provision on this extensive scale.

THE DOCTOR PIT.—This colliery has been fifteen years in operation. The pit is 12 ft. in diameter, 74 fms. in depth to the Low Main seam, and is an upcast and coal pit. The mine is ventilated in conjunction with the A pit workings by the furnace at the bottom of this pit. The lever winding-engine, non-condensing, has 41-inch cylinder, 6-ft. stroke, 16-ft. cylindrical drum, 20-ft. fly-wheel, with foot break. The drum and wheel are supported intermediately by an ashlar wall, having an opening supported at the top by a beam and column. This engine raises about 700 tons of coal per day in single-decked cages, two 10-cwt. tubs in each cage. The engine-house is built entirely of ashlar stone, and the same applies to all the other engine-houses we have named. Four plain boilers, 30 ft. by 6 ft., supply this engine at 25 lbs. pressure, fired by hand, enclosed in a shed, and fed by the winding-engine. There are eight iron coal screens; the pulley-frame, platform, and supports are constructed of wood.

Gasworks are erected near the A pit, which supply the whole of the pits, as well as the town of Bedlington, with gas.

The steam coal from these collieries may be shipped at Blyth harbour, six miles distant, and in the Northumberland Dock on the Tyne by the Blyth and Tyne Railway, or in the Tyne Dock and at Sunderland Dock by the North-Eastern Railway system.

UTILISING WASTE FROM GASWORKS.—The object of the invention of Mr. R. J. EVERETT, West Ham, is to utilise the products at the gasworks which result from the purification of illuminating gas from ammonia and sulphuretted hydrogen, when sulphate and oxide of iron have been employed for that purpose. When sulphate of iron, either crystallised or anhydrous, mixed with sawdust, is employed to purify gas from ammonia, the refuse consists of sulphate of ammonia, oxide of iron, sulphur, sawdust, and other matters, and to extract the sulphate of ammonia therefrom, and re-convert the residuum into sulphate of iron again, it is proposed to subject the refuse to the action of heat in a closed vessel, when the salts of ammonia, being volatile, sublime over, and can be collected, while the remaining iron and sulphur enter into combination with each other, forming sulphide of iron, which, by exposure to the air, can be oxidised into sulphate of iron (green copperas).

MINES AND CANALS.

SIR,—As bearing upon the above question, which was referred to in your article in last week's Journal, I beg to forward to you the following extract from the Lands Clauses Waterworks Consolidation Act, 10 Victoria, c. 17:—

CLAUSE 25.—Except where otherwise provided for by agreement, the undertakers shall from time to time pay to the owner, lessee, or occupier of any mines of coal, ironstone, and other minerals, extending so as to lie on both sides of any reservoirs, buildings, pipes, conduits, or other works, all such additional expenses and losses as shall be incurred by such owner, lessee, or occupier by reason of the severance of the lands over such mines or minerals by such reservoirs or other works, or of the continuous working of such mines or minerals being interrupted as aforesaid, or by reason of the same being worked under the restrictions contained in this or the special Act, *and for any mines or minerals not purchased by the undertakers, which cannot be obtained by reason of making and maintaining the said works, or by reason of such apprehended injury from the working thereof, as aforesaid;* and if any dispute or question shall arise between the undertakers and such owner, lessee, or occupier, as aforesaid, touching the price of such minerals the same shall be settled by arbitration.

Poynton, near Stockport, Nov. 28. G. C. GREENWELL.

OUR COAL SUPPLY—CANNOCK CHASE COAL FIELD.

SIR,—I quite agree with the remarks in last week's Journal as to the desirability of testing the resources of such mineral fields as that of South Staffordshire to the utmost, and also as to the importance of making experimental borings in places where appearances afford a rational prospect of meeting with such valuable minerals as coal and ironstone, particularly the former. We have seen within the last twenty years a grand development of such resources at the northern termination of the coal field on Cannock Chase, where the red rocks might have been supposed to have frightened more timid adventurers. Year by year the face of this vast stretch of waste land, covered with sand and gravel, and dotted here and there with golden gorse, purple heath, and green and graceful ferns, is undergoing a transformation; machinery of the most approved description is being raised, villages and towns are rising up, and large quantities of valuable coals are being raised. New shafts are now being carried down in this and other districts, but still there wants a bold and resolute wealthy company to take the bull by the horns, by going outside the boundary faults and sinking. There is no doubt but that the entire field, more or less, shows evidences of denudation, and it may be that, excepting in some slight instances, the entire field has been cut off and isolated by valleys of denudation. Still we have not gone in all cases to the extent of the denuded boundary, but have stopped short at some trifling downthrow.

One point of interest which has attracted the attention of iron-masters and coalowners along the north-eastern boundary of this coal field lies north-east of Walsall, at Aldridge. It is the nearest point of the Cannock Chase district to Birmingham, and has, therefore, so far a commercial importance which speculators have sought, but unsuccessfully hitherto, to turn into account.

The Copy Hall Company sometime ago worked the shallow mines, but quailed before the deeper measures, and they failed in making the undertaking profitable. It has been recently taken by Messrs. Pearson and Lindop, however, who have set to work to re-case and carry down one of the old shafts to a greater depth than has hitherto been reached in that district, and who have been so successful that they intend to continue the sinking. It may be premised that the measures of coal and ironstone hitherto met with are not satisfactorily recognised by the men as those common to older portions of the field; they are, however, in thickness and quality highly encouraging, and such as are likely to prove satisfactory and remunerative to the undertakers. The shaft passes through 127 yards of red rocks, red and grey marls (understood to be Permian), and a thin ring of Permian coal. Next come a series of coal measures which, omitting details, are as follows:—

	Yds.	ft.	in.
Intermediate measures	36	0	0
Coal	0	0	10
Intermediate measures	37	0	0
Coal	0	1	5
Ball measure	0	1	0
Coal	0	0	8
Intermediate measures	11	0	0
Coal, with 3 or 4 in. parting	0	7	0
Intermediate measures—ironstone	6	0	0
Intermediate measures	2	0	0
Coal, with parting	0	4	0
Intermediate measures	9	2	0
Coal, with 9 in. parting	0	5	0
Intermediate measures	15	0	0
Coal	0	1	2
Splendid fire-clay	0	5	0
Intermediate measures	9	0	0
Coal, described as very fine	0	2	10
Intermediate measures	17	0	0
Coal	0	1	3
Intermediate measures	20	0	0
Coal	0	1	6

They now bored and met with coal at 300 yards, supposed by some of the workmen to be the brooches and benches or bass coal. They left off at 310 yards in strong binds, and are so satisfied with the result that they have put up a new wire-rope, 500 yards long, and are again continuing their sinking, with the hope of meeting with the Brown Hills shallow and deep coals before it is run out. The shallow and deep coals are the bottom coal of the Wolverhampton district, split up into five in some places, in others into two, and separated at the Brown Hills by 50 ft. of rock binds. Till the shallow and lower seams of the Brown Hills are found doubts might very well be entertained as to whether this series really represents those of South Staffordshire or Leicester. Hitherto they have been supposed to be identical, and some persons holding these views are sanguine enough to expect a continuation of the coal field eastward till it joins that of Warwickshire, which has a length of some 14 miles, and a breadth of about 3 miles. There, as at Aldridge, the shafts are sunk through the Permian formation. Here, again, the coals known as the Rider, Ell, and Slate coal, giving an aggregate thickness of from 20 ft. to 27 ft., are said to represent the Thick coal of South Staffordshire; an area of 112 square miles, however, remains to be proved.

J. R.

COAL-CUTTING MACHINERY.

SIR,—Referring to the letter signed "Wharncliffe Silkstone," in the Supplement to last week's Journal, though in some respects unjustifiable, I will give him credit for the presumption in the first part of his letter, wherein he modifies my remarks; but at the same time I imagine they are sufficiently explicit that he ought to have been able to comprehend them, except he belongs to that class of mining engineers which I named in the Journal of Oct. 29. Had he given his proper name, I should have been better able to judge whether he had hailed from such a large colliery as the signature indicates, which I very much doubt.

"Wharncliffe Silkstone" is quite right in stating that I have not seen Mr. Hurd's machine at work, but I applied to the Wharncliffe Silkstone, in May last, to be allowed to do so, but was not permitted, or even received a reply to say why. I have seen and carefully perused the Blue Book, wherein is specified, in my opinion, several absurd impossibilities, that no practical man would ever think of attempting to carry out; and he also lays claim to 12 arrangements, the most of which have before been secured and described for the same purpose. I have also seen the machine itself, in its improved state, at the Albion Works, Wakefield; it had then two cylinders, I should say 6 or 8 inches diameter, and I do not know how many more were to be put on. I am an inventor of coal-cutting machinery from the date of the introduction of the pick-machine, and instead of having a "strong animus" against all new inventors of such machinery, I have the greatest sympathy for them in their labours, providing they are really novel, and wish them every success, knowing, as I do, the difficulties to be overcome in perfecting a machine to accomplish effectually the desired and yet much-required desideratum.

Now, Sir, "W. S." says he, "having seen the machine at work, can endorse what has been written concerning it." I will call his attention to some of the former statements, which might, perhaps, have escaped his memory. In Nov. 20, 1869, you will find in the *Mining Journal* a statement of this new machine (Mr. Hurd's) having been put to work in a seam of coal 20 inches thick, and undercutting 6 feet 6 inches, 3 feet deep, in four minutes, or better than 30 yards per hour with a 4-inch cylinder; and which machine was also to be put to work in collieries in Yorkshire in a short time, with all the improvements and modifications added which practice had suggested since it had been at work. In May, 1870, we had a glowing account of the modified machine being tested at Wharncliffe Silkstone Colliery, where it was stated to have cut 4 feet, 3 feet deep, in six and a half minutes, or about 10 or 11 yards per hour; the size of cylinder in this case was not given, or the pressure of air, but we had a large amount of *puff*. And now, in October last, the machine with its improvements was again tested at the same colliery, and your correspondent gives the result at 8 to 10 yards per hour as the amount of work actually done. The May account also stated that this machine was first tested at Wharncliffe Silkstone Colliery. It, therefore, appears from these reports that this machine has been going on *improving* in a retrogressive form—from 30 yards per hour with a 4-inch cylinder, till it is now able to do 8 or 10 yards per hour with six or seven times the amount of cylinder room, and this all "endorsed" by "W. S.;" and also Mr. Hurd's statement, thus:—In the Supplement to the Journal of Oct. 29 he is made to state that a saving of 8d. per ton can be effected by his machine over hand labour. In the Journal of Nov. 12 he (Mr. Hurd) states the saving is one-eighth, and not one-eighth per ton; and in last week's Supplement he again states, by way of correction, that the saving *should* have been one-third over hand labour in all cases except the Wharncliffe Silkstone, which is, I believe, the only place where the machine has been tried.

In conclusion, I will only add that I have consulted a proper authority as to the validity of Mr. Hurd's patent claiming the endless chain, which is the only feasible one, and I am advised that it is bad.

Nov. 30. J. ROTHERY.

ROCK-BORING.

SIR,—Annexed is a note of time occupied in drilling a hole in Slate Rock. It would be most instructive if your various correspondents who have the opportunity would take notes in various localities and in different strata. I may state that the data were taken by the manager of the works, who, unobserved by the men engaged boring the hole, or by anybody, sat watch in hand, and carefully noted the operation. It is, therefore, reliable, and is a sample of ordinary work. If any other information is wanted it will readily be given. May I ask some of your correspondents to give me the duty in foot-pounds done by the men? DETAIL.

Slate quarries, Nov., 1870. *Note of time occupied, and blows struck, by A, B, and C, three men working under contract, while boring a hole 1¼ in. diameter, 38 in. long, in slate, two men striking, one holding the drill. Weight of hammers, 7 lbs.; shafts, 3 ft. long:—*

Time, hour.	P.M. min.	Blows.	Remarks.
1	.....	.....	.... Commenced to the hole.
1	10	.....	.... Preparing stage.
1	17	198	....
1	19	.....	.... Cleaning hole.
1	22	94	....
1	25	.....	.... Cleaning hole and adjusting stage.
1	30	214	....
1	32	.....	.... Cleaning.
1	33	19	....
1	33½	.....	.... Cleaning.
1	39	285	....
1	40	.....	.... Cleaning.
1	45	.....	.... Smoking.
1	49	184	....
1	50	.....	.... Cleaning.
2	4	.....	.... Smoking and resting.
2	7	47	....
2	8	.....	.... Cleaning.
2	13	240	....
2	14	.....	.... Cleaning.
2	20	249	....
2	22½	.....	.... Cleaning.
2	29	259	....
2	31	.....	.... Cleaning.
2	35	155	....
2	40	100	....
2	43	.....	.... Cleaning.
2	49	275	....
2	50	.....	.... Cleaning.
2	55	300	....
2	59	.....	.... Cleaning.
3	4	234	....
3	9	.....	.... Cleaning.
3	14	238	....
3	29	.....	.... Cleaning, drying, &c.
3	36	.....	.... Charging and fire.
2	36	3091	Total time and blows.

NOTE.—While the man who guided the drill was occupied in preparing the stage, cleaning, &c., the two hammer men were standing idle, so that the time stands thus:—

Preparing the stage, 10 minutes, or proportion of whole	6·4	per cent.
Cleaning hole, smoking, &c., 38 minutes	24·3	"
Charging, 22 minutes	14·2	"
Time actually striking, 86 minutes,	55·1	"
Total	100·0	

Blows for every sixteenth part of an inch, 5.

AERATED STEAM.

SIR,—Two inventions have recently been noticed in the *Mining Journal* relating to the use of combined air and steam, instead of steam alone, and, if the results be anything like those stated, I believe the colliery proprietors in this district would be very ready to adopt one or other of the inventions. It has been shown, I think, that cold air pumped into the boiler effects a considerable saving in the consumption of coal, and also that hot air introduced into the bottom of the boiler does the same, and also prevents incrustation—a very important point; but I have not been able to comprehend accurately the principle upon which the injected air acts—since, theoretically, it would appear that quite as much additional power would be required to force the air into the boiler as would be obtained in addition by forcing it in, although in practice the reverse effect seems to have been produced.

The value of the principle having been demonstrated, and the inventors being, of course, desirous of having the arrangement brought into general use, it occurs to me that the best course would be for those concerned to state, through the Journal, the precise details of the apparatus, the cost of it for the various sizes of boilers, and the amount of economy effected. As this latter item has been put down at as high a figure as 50 per cent., there could be no objection on the part of the inventors to state the average economy obtained with some given engine, taking a period of three or six consecutive months. If this were done it could readily be introduced into this district, and I think I could render some assistance in introducing it. R. A.

Newcastle, Nov. 26.

COMBINED PEAT AND COAL.

SIR,—I was somewhat struck with the boldness of the proposition referred to in last week's *Mining Journal*, for using as a steam fuel a mixture of bituminous coal and peat, but upon mature consideration I am inclined to think that it is not so unreasonable as at first sight appears. Of course, such a mixture could never succeed in furnaces of the present construction, but there would certainly be as little difficulty in modifying them to adapt them to the fuel than there has been in modifying the furnaces in some of our vessels of war to adapt them for burning the mixture of bituminous coal and anthracite. The sole difficulty that I anticipate in either case is that arising from inability at some important moment to obtain the requisite supply of both fuels, for the fact cannot be disguised that a furnace adapted to the burning of mixed fuel is not adapted for burning either fuel alone, being, of course, too well ventilated for the one and too little for the other. It is for this reason that I should regard it as undesirable to use mixed fuel as a steam fuel for marine purposes under any circumstances, but I do not think the same objection would apply on land.

With regard to the mode of effecting the combination, I believe that nothing would be equal to partially drying the peat, then reducing it to powder, combining it with small coal, and forming it into bricks, either with tar or any other suitable binding material. This would at the same time afford a suitable mode of utilising small coal and consuming peat. Of course, circumstances would determine whether it would be preferable to carry the coal to the peat or the peat to the coal, but I think that in the majority of cases it would be found best to carry the coal to the peat bogs. In many districts

small coal could be readily purchased at (say) 2s. per ton, and whatever might be the freight to the bog there would remain the difference between the prices of small and of round coal. In some parts of Ireland this would give them an advantage in the cost of their steam fuel of nearly 10s. per ton, for to the difference in the cost of the coal would be added the profit of burning large quantities of peat, which is now lying useless. If this could be done, many industries now almost unknown in Ireland would flourish there, and the general prosperity of the country would be much enhanced.

Nov. 30. D. F.

DYNAMITE.

SIR,—Some of the mining proprietors in this neighbourhood have proposed to employ Dynamite as a blasting agent, instead of gunpowder. Would someone interested kindly inform me whether it is lawful to use it, or whether it is a prohibited explosive, along with nitroglycerine, and if the same restrictions exist with respect to its carriage from place to place? I understand parties who have used it to say it is "a much more effective agent than gunpowder, and can be used with greater effect and safety in wet holes where the ground is full of loughs or vughs," as they are called in Cornwall. Perhaps some of your numerous readers who have seen it practically tried can inform me if this is the case or not? IRON ORE PROPRIETOR.

Whitehaven, Nov. 28.

THE FUTURE OF MINING IN SPAIN—No. II.

SIR,—I brought before your notice last year the New Mining Laws that had been decreed by the Provisional Government, and to what extent mining properties were now secured from the litigation to which they were subject formerly. Such has been the importance of this measure that mining properties in Spain at present stand on a safer footing, perhaps, than any other country. The result is proving itself practically throughout. Both natives and foreigners are now daily increasing their mining interests, and I have been surprised, after an absence of five years from this country, to see the great impulse that mining has received. Add to this the railway communications and their extent throughout, and the consequent reductions in land carriage, which have added materially to the value of mining properties. Four coal districts have been also placed in railway communication with some of the most important metallic regions. I am confident from all that has come under my notice within the last three months in travelling through this country that a great future is allotted to Spain in her mining interests.

The richest mines have been in the hands of the Government till very lately, thereby exercising a most baneful monopoly. By degrees these are being sold off or rented, as has been the case with the Linares Government Mines, which possess 8000 metres on the course of the lodes, and the first steam-engine employed on them was started last week by a Spanish private company. What a sight for a father of mining—one steam-engine on such a course of rich lodes! Mr. W. Bosiston, the contractor for this engine—a most competent engineer in this mechanical branch—has contracted for several engines with the aforesaid company. This speaks well for the future of native companies, feeling as they do practically the perfect security given to mining properties in their title deeds through the new laws.

The Government has disposed of all its native sulphur mines, salt mines, the manufactories of saltpetre, and the copper mines of Rio Tinto. The manufacture of powder has also been declared free. The Almaden Mines are the only exception to this rule; the Government will not dispose of these, and well may it be excused for not parting with them. They are inexhaustible; the reserves, as well as the new discoveries in the deepest points, are incalculable. I measured at the 10th level, 300 metres from surface, three parallel lodes, the aggregate width of 21 metres of cinnabar, varying from 15 to 30 per cent.

Linares, Nov. 16. HENRY SEWELL.

MINING IN THE GWENNAP DISTRICT.

SIR,—At a moment when events, new even to the past varieties of revolution, are shedding perplexity and terror among the capitalists of Europe, and narrowing the range of natural speculation—when, by the collapse of one wealthy and brilliant nation, the merciless violence of another, and the Punic Faith of a third, French Rentes, Turkish stock, and Russian loans are rushing to zero and ruin, it is a legitimate occupation of well-informed professional men to point their friends to solid rock, on which a man with a healthy purse may, as our American cousins say, "put down his foot," as on a piece of adamant. Faith may well fail in foreign bonds, after what we have lately witnessed and may yet more painfully see, but no convulsions can shake the present security, or cloud the future promise, of British mines. The value of metals is inherent, substantial, and inviolable, and arises in proportion to the growth of population and the progress of scientific invention, which turns these gifts of nature to profitable account, by meeting the varied and multiplying wants of our race; and it requires only a knowledge of facts and ordinary capacity to interpret their meaning—to render investments, in certain cases, all but infallibly safe. Even the slight and ephemeral fluctuations in the market price of metals leave a permanent and growing average of value, so that those who invest for income, and not for momentary speculation, are more than secure. Only, I say, let purchasers of shares be in the hands of experienced guides, and become themselves cognisant of patent and instructive facts, and they may be not only tranquil but triumphant in looking to the issue of their enterprise. And facts, respecting some mines especially, lie in a small compass, and can be shown in a few and expressive figures. It is, indeed, sometimes said by the cynical and perverse that "nothing is so false as figures," but, among the small phases ever coined to mislead the unthinking, none was ever invented so paradoxical, delusive, and absurd. So far from the charge being true, the intelligence and solidity of the commercial and financial worlds rest on the unchanging and unchangeable basis of figures. Fraud may forge these symbols, doubtless, as it does signatures to cheques and bills; but facts may be expressed in figures, and become capable of literal demonstration, and, even where this is unattainable, may afford the highest ground of moral certainty—that cogent probability which well sustains and justifies the habitual convictions and actions of men. To a very short column of figures of this class I am desirous of leading the attention of your thoughtful readers, as illustrative of the wealth and promise of the Gwennap district of Cornwall in general, and of West Jewell Mine in particular:—

Tresavean has paid in dividends	£ 454,432
Beauchamp Buller	120,000
Penstruthal	130,000
Wheal Jewell (same lode as West Jewell)	400,000
Damsel	180,000
Gorland	150,000
Treskerby	200,000
Treveskey and Barrier	37,000
Great Consols and United Mines	1,109,828
Unity	330,000
Wheal Maid	40,000
Poldice	200,009

It will neither be nor appear on my part, I trust, either arrogant or needless to give at the present moment this description of mining profits, for time and fresh discoveries must enlarge, modify, and improve the representation to those who know the facts in general; while such current history is indispensable for that new class of readers, either brought into the field or to be supplied with reliable information by the extensive and extending circulation of your Journal, and more especially for many who have recently become shareholders in this valuable property, through which run the principal lodes. Properly to appreciate its worth, the following points must be carefully observed:—1. That, though worked but scarcely six months, it has already sold nearly 2000*l.* worth of tin in the stone, at 7*l.* per ton (a coarse test of its value), which when dressed may fairly realise 75*l.* or 80*l.* the ton, and now that the 54-inch cylinder-engine is at work it is forking out the water to admiration.—2. From old workers we know that there are several ends which many tributers would gladly take at 5*s.* in it, which itself would leave a handsome profit to shareholders.—3. There are 300 fathoms of ore ground already open, and this above the adit level, or 50 fms. from surface.—4. There are known to exist six lodes traversing the entire extent of the sett—three each of tin and copper, and in addition three cross-courses.—5. In a former working 400,000*l.* profit was made on one of the copper lodes. This aggregate of promising facts and profitable results fully warrant me in saying that I know of no mine in my experience which has so rapidly developed into a paying state, and offered such attractive prospects, and I confidently expect that at the January meeting the company will be capable of paying the first dividend, which must improve at each succeeding meeting, as they erect stamps and extend the works. Above all—the crowning fact—is the character of this mine, for the way it is opening clearly shows that it is not merely a squat of ore, but one of those masterly lodes of the Gwennap, which will take indefinite years to exhaust. Knowing your readiness, or rather anxiety, to furnish your readers with the latest reliable reports and opinions I forward this letter. JOHN R. PIKE.

3, *Crown Chambers, Crown-court, Threadneedle-street, Dec.* 1.

PRINCE OF WALES MINE.

SIR,—I perused with some interest the details of our general meeting, as reported in last week's Journal, but it appears to me, if there be any truth at all in Capt. Richard Pryor's statement, that our mine does really contain tin in remunerative quantities, and that the fact was pointed out some time since to our manager—who, according to Capt. Pryor, knows "tin is there"—that our executive are much to blame in not having had the matter practically tested, without waiting for a special resolution for that purpose. As a shareholder at the meeting very properly observed, "If Capt. Gifford would not do it, somebody must be found who would." It is no doubt but natural that Capt. Gifford would desire to have the credit of having made a discovery, the importance of which may prove to be incalculable; but having failed to do so, he must not be allowed to be a stumbling-block in the way of our mine's progress. Practical men in the locality, it seems, laughed at the idea of tin being found in the mundic at New Great Consols, but, according to a statement which I saw in last week's Journal, that mine has already sold 40 tons of tin. Surely this is a fact which should prove conclusive even to Capt. Gifford. I hail with satisfaction the step taken at the meeting to decide this question without delay, and I hope that the result of the investigation will appear in the Journal at the earliest possible date.—*Nov.* 29. A SHAREHOLDER.

EAST WHEAL LOVELL.

SIR,—Drowning men catch at straws. Who would have thought that the detractors of this mine would have so far bemeaned themselves as to insert in a cheap newspaper a glaringly unfavourable report, and to have gratuitously circulated copies far and wide? Do men thus expend their money for the advantage of their fellow-creatures, and, if not, what other object can there be but to intimidate *bona fide* shareholders into parting with their interest? And for whose benefit? Certainly not that of the shareholders—for I, as one of them, am a perfect stranger to those who have so disinterestedly (?) proferred advice. Surely, the time has long passed away since such transparent proceedings can have any effect, and yet it is true that there are even yet persons living in the less cultivated parts of Cornwall who, in their simplicity, are sufficiently self-deluded to imagine that by such an indirect act of misrepresentation shareholders *may* be cajoled into blind belief.

Referring to this mine in last week's Journal, I find, Sir, that in your City article it is stated that Capt. William Pascoe had inspected the mine *since* the general meeting. This is obviously a mistake, because the last inspection-day was the day of the meeting (Nov. 16). The official report, dated Nov. 24, said that "no alteration had taken place in the mine since the meeting;" and Capt. Quentrall, be it remembered, had an opportunity of inspecting the mine on Nov. 24, while Captain Pascoe could not have seen the mine since Nov. 16. In another part of last week's Journal reference is made to the fact that about this time last year Capt. Pascoe inspected the mine on behalf of Mr. Broad, of Plymouth. On reference to the Journal of the following week (Nov. 13, 1869), I find that Capt. Quentrall replied as follows:—"In consequence of Capt. Pascoe's extraordinary report that the shaft had shortened by 18 ft. of granite from westward, I ordered the men to take down the western end, and lengthened the shaft westward, where there is a fine lode for tin, 4 ft. wide, or more. . . . I today enquired of Capt. Pascoe how he could write such a report, *and he positively denied having done so.*"

Referring to this, in the Journal of Nov. 20, Capt. Pascoe infers that, although the text of the report was his, the material unsatisfactory point in it—the interposition of granite in the western end—had been altered, *probably by mistake*, from 8 to 18 feet! Seeing that the whole question hinged upon this, Capt. Quentrall was unquestionably justified in stating that it was *not* Capt. Pascoe's report. But what did Captain Pascoe say in the following week? Why, this—"I have this day again inspected the mine, and am pleased to say the prospects are greatly improved—the deposit of tin in the shaft is very rich, and lengthening westward under the granite." This must have been very encouraging to those who, panic-stricken upon a misstatement, were induced to sell their shares at low prices. And, seeing that the tin ground is now "lengthening westward under the granite" below the 80, as it did below the 70, who shall say that this Capt. Pascoe will not in his next report copy the words which he penned twelve months since? But whether Captain Pascoe did or did not write that report in November, 1869, need not now be enquired into; the value of the document may be judged by the fact that from the time the report appeared the shares steadily advanced in market value from about 20*l.* to 36*l.*, while the mine has since then regularly paid 2*l.* per share per quarter. So much for the value of the reports of inspecting agents. ONE BEHIND THE SCENES.

Helston, Nov. 28.

EAST WHEAL LOVELL.

SIR,—In looking over last week's Journal I see an allusion is made to my reports of the above mine. I beg to say the last week's report is mine, unaltered, and is as favourable to the concern as the prospects would allow. With reference to my former report, of last November, it was stated that the granite had projected 18 feet, when it should have been 8 feet only: the latter was perfectly correct. This mistake I admitted when I saw Captain Quentrall the following week, but did not disclaim the paternity of the report, as I am not a person to make an assertion and deny it. I gave a candid and faithful report of the mine the day I inspected it, but in the following week I found the prospects had much improved, which I was glad to acknowledge. The present intrusion of the granite is very different, being not of a congenial character, and having a regular angle of about 45° east materially shortens the tin ground; and I speak, fearless of contradiction, that the present bottom of the shaft is within a short distance from the dip of granite at the eastern end of the tin deposit, and that the lode, by assays, was not of more value than reported. It will require no great length of time to prove the justification of my statement. WILLIAM PASCOE.

South Wheal Frances, Camborne, Nov. 30.

MARKE VALLEY MINE, AND ITS MANAGEMENT.

SIR,—Will you allow me, through the medium of your valuable Journal, to call the attention of those connected with the management of Marke Valley Mine, to a subject of great importance. I have been informed by practical miners who have worked in the mine, that deposits of tin are often met with, and if these were carefully preserved they would well remunerate the adventurers for any expense which might be incurred in dressing the same, and would prove a good source of profit to the shareholders. Now, Sir, entertaining as I do a high opinion of the able manager of this mine, and as I give him credit for "knowing tin," I am sure if he were cognisant of this he would not fail to turn it to account. I hope the managers of the mine will give this matter the attention which it seems to demand. A SHAREHOLDER.

[For remainder of Original Correspondence see to-day's Journal.]

PRECIOUS METALS AND PRECIOUS STONES—No. I.

The first of two lectures on this subject, by Prof. JOHN MORRIS, F.G.S., of University College, was delivered at the London Institution, Finsbury-circus, on Thursday evening, and embraced an account of the Precious Metals and their Distribution. The interest in the lecture, which was listened to with marked attention throughout by a large audience, was much increased by the large number of rare and beautiful specimens with which it was illustrated, and which greatly facilitated the thorough explanation of the most minute details.

Among the numerous elementary substances known to the chemist some, from their peculiar properties, are classed as metals, and distinguished from the other bodies by their lustre, opacity, colour, weight, and being conductors of heat and electricity. The metals are further separated from each other by their difference in weight, fusibility, ductility, malleability, by their affinity for oxygen, and the reaction with each other or with the other elementary bodies, some being allied to sulphur and others to phosphorus, among the non-metallic substances. Some are known as alkali metals, some as alkali earth metals, some as base and others as noble metals—this latter term being applied to gold, silver, mercury, platinum, palladium, iridium, osmium, ruthenium, &c.; the term precious metals being generally applied to those which undergo the least change, and are the most valuable in the arts, and for the purposes of currency, as gold, silver, and platinum. It is to these that I propose chiefly to direct your attention, as to their antiquity, characters, distribution, associations, geological position, and economical uses.

Gold, as is well known, is yellow by reflected light, and green by transmitted light, is very malleable and ductile, and capable of being drawn out into very thin wire, or beaten into leaves about 290,000ths of an inch in thickness. From usually occurring in a native state, and in alluvial deposits, it was readily found, and thus the knowledge of it dates from a remote antiquity; nearly 200 notices of it occur in the Bible under different uses, and about 80 in its connection with silver. This gold appears to have been chiefly obtained from Nubia and Ethiopia, and was worked from granite in the district which lies between the second cataract and the Red Sea. The Egyptian term for gold being Naub, or Nub, hence Nubia; and that for silver, Hat or white gold. Gold, therefore, has always been an object of value, and eagerly sought for by all people, from its peculiar properties of ductility, malleability, and freedom from corrosion. Gold was early known also in this country, as the Romans appear to have found gold coins among the ancient Britons, and to have known of its existence at Gogofau, in Wales, where are the remains of the ancient working described by Mr. Warington Smyth, in the Memoirs of the Geological Survey. Gold occurs chiefly in the native state alloyed with more or less silver, and occasionally, but rarely, with tellurium, bismuth, mercury, palladium, and, more or less, intimately combined with iron and copper pyrites, some lead, and antimonial ores; the state in which it exists in them is somewhat doubtful.

GEOGRAPHY.—Gold, like iron, is very widely distributed, but, unlike iron, is chiefly native, and was formerly thought to be restricted (like the other precious metals) to the tropical regions of the globe. In this country it has been found in Devon and Cornwall, South and North Wales, the Lead Hills, Lanarkshire, Perthshire, and recently in Sutherland, and to the close of the last century in Wicklow, where about 10,000*l.* was obtained. In Europe it was found in Bohemia, Austria, Hungary, Transylvania, where it is now worked, in the sands of the Danube, the Rhine, the Rhone, and in Spain and Italy. But the largest supply is from European and Asiatic Russia, on the eastern side of the Ural, rarely on the western side, and along the prolongations of the Altai range, which are parallel to the Urals. In Thibet, China, and some parts of India, Japan, and the neighbouring islands, in various parts of the East and West Coasts of Africa it is also found; whilst in America it occurs on the Atlantic or Appalachain slope, or North and South Carolina, Virginia, Georgia, Tenessee, and Alabama. The Pacific slope, embracing more than 1,000,000 square miles west of the Rocky Mountains, including California, Nevada, Oregon; besides which Washington, Utah, Montano, Idaho, Arizona, Colorado also produce it. Gold deposits are also met with in Mexico, which is, however, chiefly a silver-producing country. In Central America, Costa Rica, Nicaragua, &c., South America, Brazil, where are the celebrated mines of the St. John del Rey and Minas Geraes, the Taquaril and the Don Pedro North del Rey, it sometimes occurs there with palladium in itaberite, and jacotinga in rocks, associated with gneiss. Brazil produced its largest amount of gold about the middle of the 18th century, 1751-61, yielding about 20,000 lbs. weight of gold. In Peru, about Hunylas and Tarma, and in the valley of the Chuquiaguillo, chiefly in alluvium, derived from Silurian rocks. In Bolivia, chiefly along and in the streams that flow down the eastern side of the Cordillera, at the sources of the Rio Grande, and at Tipuani, near Sorato, the beds, called *veneros*, are clays covered by sands and gravels. In Chili gold occurs of two geological ages. Firstly, in the *old granites*, which break through the slates and schists of the coast; and, secondly, in the diorites, traversing the newer strata, including those of the cretaceo-oolitic period. Gold occurs in the granite, which is much decomposed, and in the quartz veins in the schists. The great mineral wealth of Chili is in the lodes which traverse the liassic, oolitic, and cretaceous strata when associated with the diorites.

In British possessions gold occurs variously distributed through the length of Nova Scotia, where it was first discovered in 1860, in rocks of Silurian age, associated with granite, which cover an area of 4000 square miles. Mr. Hinde considers that the gold was contemporaneously deposited with the sediments in the ocean, and subsequently concentrated, so as to form contemporaneous veins, as there is no evidence that intrusive rocks or dykes had any share in its introduction; he shows also that the Silurian rocks with gold veins are overlain unconformably with the lower carboniferous conglomerates, containing gold, covered by beds of shale and sandstones, and other conglomerates, about 600 feet thick. Gold was found near Chandiere, in Canada, in 1847; in British Columbia, in 1856, on the Fraser river and its tributaries from the Rocky Mountains, both in the terraces and in the beds and shores of the streams, and at Cariboo, which is the largest and richest district. The gold regions appear to be a continuation of those of Oregon, and probably of same age as the gold field of California. In Australia, the Victoria colony is the most productive: gold was first found at Clunes in 1850. Gold is abundantly distributed in various parts of South Australia, New South Wales, Queensland, and Victoria, from whence such enormous supplies have been received during the last ten to fifteen years, the yield of which district in 1869 was about 1,340,838 ozs. It is also worked in Tasmania, and in the Marlborough, Nelson, Canterbury, and Auckland districts of New Zealand, where it was noticed in 1842.

As regards geological distribution, gold occurs, as before stated, chiefly in a native state, and is found distributed in igneous or pseudo-igneous rocks, as granite, diorite, porphyry, &c., and in altered sedimentary or schistose rocks, somewhat of a talcose nature, belonging chiefly to the Silurian, but also of cretaceo-oolitic age; *in quartz* veins traversing these rocks, and in superficial or *alluvial* deposits derived from the disintegration of the former. The subject of mineral veins has long occupied the attention of geologists, chemists, and mineralogists, and many suggestions or theories have been proposed to account for them from the time of Werner, or even earlier, to the present period; and heat and water have been both suggested as the *cause* of their origin. Now, mineral veins, or lodes, are fissures in the rocks, which in most cases may have been produced by their contraction, or to various cosmical changes which the more solid parts of the earth's crust have undergone, and occur in harder rocks, or those which have been subsequently altered, and generally in proximity to, or connected with, masses, or dykes, of igneous matter. These veins having been filled by mineral solutions from above, according to the opinion of Werner, or by other modes of aqueous deposition, by sublimation in vapour and deposition, by intrusion of the materials in a molten state, by segregation during consolidation from the surrounding strata, or by electric action in some way arranging their contents. The subject is one of difficulty, and equally applies to gold.

Now, vein gold was for a long time considered to be restricted to the older palæozoic rocks, chiefly the Silurian, as advocated by Sir R. Murchison, in 'Siluria;" and although more abundantly found in that group than in other rocks, late researches have shown that still newer formations, as the liassic, oolitic, and cretaceous strata, equally contain vein gold; and we owe to Mr. David Forbes a further interesting and suggestive fact, that there appears to have been two great epochs of gold intrusion connected with two different kinds of igneous matter—the granites and diorites—the former of Silurian or palæozoic age, the latter post-oolitic, or in part cretaceous, a suggestion to which attention in the favourable localities should be directed. The older are the most numerous, and to this period belong Sutherland, North Wales, the Urals, Altai, Nova Scotia, Canada, California in parts, Central America, Chili, Bolivia, Brazil, and Australia; while to the later beds are assigned certain gold veins of California, and some in Peru, Bolivia, and Chili.

With regard to the period of introduction of the gold into the veins, Sir R. Murchison, from his investigation of the Urals, is inclined to believe that it was comparatively modern, and near to the Pliocene period, basing his views on the fact that no gold had been found in those deposits—which, earlier than the tertiary, had been formed out of the pre-existing Silurian strata, such as the Permian conglomerates.

The mode of filling the quartz gold veins has been variously described, as previously mentioned, either by concentration from the surrounding matrix, by the intrusion of the silica in a molten state with the gold, or by the agency of solutions holding quartz, gold, and other metallic substances, which have been subsequently decomposed, or by sublimation or segregation. To whatever cause they may be attributed, there are the gold veins in comparative abundance in the rocks to which I have alluded, and deep in the earth as these may be traced, we can scarcely realise their former extension upwards without fully considering the enormous amount of surface denudation to which the respective areas have been subject, from which the large amount of gold is annually obtained, because it is this latter source which affords the chief supply.

Gold occurs in two kinds of mines—placer and vein mines. He then considered three or four points connected with the subject of alluvial gold.

1.—The original quartz veins in the rocks containing gold.

2.—The nature of the alluvial strata, their age, character, and mode of occurrence.

3.—The origin of these deposits.

4.—The state in which the gold is found in these beds, as to form, size, and character.

1.—The filling of the veins has been already described. The gold is found in them in various modes, either crystallised, in threads or strings, in thin plates or lumps, in spangles and scales, distributed through the quartz, or occurring on it or mixed with copper and iron pyrites, or other metallic ores, as stibnite, valentinite, &c.; it is never quite pure, but generally alloyed with silver.

2.—The alluvial deposits or placers, pay-dirt, wash-dirt, diggings, &c., are of late Tertiary age, and consist of sand, gravel, clay, and ferruginous matter, more or less alternately arranged, and sometimes compact, or cemented together. Rarely, if any, traces of marine remains have been found in them, but bones of terrestrial animals belonging to the later or newer Pliocene period, as the Mammoth, in Siberia, and the extinct mammals in Australia, or to some slightly older bed. These deposits are of various kinds and positions, occurring at different elevations down to the sea level, and generally occupying old valleys or river courses, and are sometimes covered by sheets of volcanic matter, as in Victoria and California.

3.—They have been caused by the general disintegration, either atmospheric or marine, to which the area has been subject, and thus deposits of many feet in thickness have been formed, which have been re-arranged and sorted by rain, streams, and rivers. As examples we may cite those of Russia, California, Australia, and many other localities.

4.—The gold is found of various sizes, from large pieces or nug-

gets, to small grains or scales, and is generally said to be purer than the reef-gold, the size of the nuggets in the older drifts being considered to be due to the richness of the upper part of reefs now destroyed, or to subsequent segregation in the drifts, according to Mr. Selwyn, or to being chiefly found in the *upper* drifts of the valleys, their purity being attributed to the removal of the extraneous matter by chemical action.

Attention was also directed to the minerals which have been mistaken for gold, as iron and copper pyrites, yellow mica, orpiment, chrysolite, also brass filings; and the simplest means of detecting them was pointed out. The economic uses of gold, and some points connected with the coinage, were alluded to, in which the standard for gold of the British Mint (11 gold to 1 alloy) was that of Russia, Turkey, Portugal, and Brazil, while the alloy of 9 to 1 was used by France, Belgium, Switzerland, Italy, Spain, Greece, Holland, and the United States. Reference was also made to the care used in the refining of the gold for coinage, showing that even 1-2000th part of bismuth, lead, antimony, and arsenic would render the gold brittle; and also to some points on the volatility of silver and gold, but on these and other subjects the lecturer referred to the able and valuable report of Mr. Chandler Roberts, forming part of the General Report on European Mints, just published by authority.

PEAT, AND ITS PROFITABLE UTILISATION.

It appears from the very valuable and interesting paper read before the Society of Arts, on Wednesday evening, by Mr. ROBT. M. ALLOWAY, M.A., that notwithstanding the many who have failed to turn peat bogs to profitable account, the object has at last been accomplished—a peat-coal described as equal to pit-coal being produced with great facility, at a price which permits of its being sold at 8s. per ton, after allowing a fair profit to the manufacturer. Mr. Alloway describes his process as consisting of two plain principles, which he trusts will not be despised for their simplicity, nor for their appearance of being only improvements on the old barbarous method of air-drying peat, which generally takes from three to four months. It may be remarked that his process appears to be little more than the old hand-turf method improved, which, of course, he cannot altogether gainsay, but his improvement is as great and important, and carries as much difference as there exists between the amount of one to forty, his drying process being completed in three days, instead of in three months, so that in the season he takes from 30 to 40 crops from the same plot instead of one. His peat-coal is as portable as pit-coal, whereas common turf is almost unportable at least to any distance. In place of compressing machinery with hot plates or flues, &c., for drying, Mr. Alloway has enlisted the service of three grand natural wonder-workers, who do what he wants without cost or payment—in summer the sun and the wind, in winter the rain. The rain lends great help to the mashing or pulping, which is his first process, and the sun and the wind dry his products in much less time than any artificial heat or wind-machine ever did, and at a twentieth part the cost.

The peat-bank being opened in the usual way, one man digs and throws the turf in large sods to six others, placed in line before him; each man strikes his sod with a wooden mallet, and by a few blows completely mashes it up. The peat thus broken is shovelled at once into an adjoining water-hole, from which a similar bank of peat had been previously taken, and had become in consequence partly filled with water. There it remains, melting into a thick pulp, until required for moulding. The moulding is performed by women, girls, or boys, who take as much as possible in their hands and pat it, each pat as made being placed just touching its neighbour on the drying-table. As the pats dry, which they do very rapidly, they shrink asunder, whereby the air passes more freely between them. When dry, on the third or fourth day, one man or boy pushes them off the tables very rapidly into a long wheel or hand barrow on the other side, by which they are conveyed to open lattice-work wooden sheds, which are built conveniently adjoining, for storage, and very soon after are fit for sale or use. The employment is very healthful, and from the nature of the process some portions of it is going on at all seasons of the year. The value of the prepared peat has been extensively recognised in Ireland, and confident anticipations of the general adoption of the process by which it is produced are justly entertained. The reading of the paper was followed by an animated discussion.

FOREIGN MINING AND METALLURGY.

The Anglo-Russian difficulty not having become more threatening up to this present writing—although it is impossible to say what a few hours may involve one way or the other—Belgian industrials have somewhat regained confidence, and have begun to hope for a peaceful solution. At any rate, they greatly desire it, as a war between England and Russia would be a rude shock to Belgian metallurgical industry. The Belgian blast-furnaces are still disposing of their production tolerably well. The imports of iron minerals into Belgium in August amounted to 38,357 tons, against 57,461 tons in August, 1869; in the first eight months of this year they footed up to 424,130 tons, against 376,924 tons in August, 1869. The total imports of iron of all kinds into Belgium in August, 1870, amounted to 3517 tons, against 4059 tons in August, 1869; and in the first eight months of this year to 65,543 tons, against 37,235 tons in the corresponding period of 1869. The exports of minerals from Belgium amounted in August to 13,242 tons, against 10,294 tons in August, 1869; and in the first eight months of this year to 127,396 tons, against 108,525 tons in the corresponding period of 1869. The exports of rails from Belgium declined in August to 7139 tons, against 19,486 tons in August, 1869. The rail exports of the first eight months of this year were 93,889 tons, against 103,746 tons in the corresponding period of 1869. The exports of rails to the Zollverein, France, and Spain show a marked increase; those to Russia, the Low Countries, Turkey, Italy, and the United States exhibit a sensible decrease. The annexed table shows the exports of iron of all descriptions from Belgium during the first eight months of 1870 and 1869:—

Destination.	1870.	1869.
Russia ..... Tons	45,611	55,097
Sweden and Norway	1,850	732
Denmark	75	598
Zollverein	34,901	22,507
Hanse Towns	2,609	3,162
Low Countries	16,198	18,665
England	8,481	8,347
France	28,067	27,295
Spain	2,817	333
Italy	6,670	13,493
Switzerland	2,809	2,286
Austria	1,197	1,320
Roman States	35	28
Turkey	16,738	27,429
Egypt	1,493	30
United States	6,954	10,313
Cuba and Porto Rico	1,337	691
Brazil	362	663
Rio de la Plata	111	440
Chili and Peru	273	361
Other destinations	130	364
Total	177,818	197,114

In these totals August in each year figured for 15,447 and 31,605 tons respectively. Makers of railway plant in Belgium were recently promised by the Belgian Minister of Public Works an order for 520 trucks and 30 locomotives, but they have not yet actually received this commission.

There is nothing very striking to report as to the state of the Belgian coal trade. The collieries continue to accumulate stocks; but, nevertheless, prices are firm. In Germany coal has become very dear; workmen are scarce, the number remaining in the country not being sufficient to provide for the ordinary current extraction. German industrials have thus found it necessary to supply their wants in Belgium, and some rather important contracts have been concluded with Belgian coal workers. Thus, the war which has done Belgium so much injury, by greatly interrupting communications with France, the principal external market for Belgian coal, is now beginning to offer Belgium a slight compensation. Plans submitted to the Belgian Government by the Coal Basins of the Hainaut Railway Company, in order to unite the extraction pits of the Fontaine l'Eveque Colliery Company to the Fontaine l'Eveque station, have just been approved by the Belgian Minister of Public Works. The expropriation of the lands required for the junction will take place by virtue of the Belgian legislation on railways, and the section is expected to be brought into working early next year. It is to be desired that the construction of all industrial branch lines should be pushed forward as actively as possible, both in order to provide employment for the working classes, and also to promote the interests of Belgian industry. With regard to the particular branch in question, it is especially to be hoped that it will be energetically prosecuted since the General Company for Promoting the National Industry of Belgium has just definitively signed with the Coal Basins of the Hainaut Railway Company a convention by which it assures to the latter the financial resources required for the construction of lines conceded to it. It appears from official tables that the quantity of coal imported into Belgium in August amounted to 13,200 tons, against 20,826 tons in August, 1869. The imports of coal into Belgium for the first eight months of this year were 148,618 tons, against 160,154 tons in the corresponding period of 1869. The imports of coke into Belgium in August amounted to 249 tons, against 171 tons in August, 1869; and in the eight months ending Aug. 31 this year to 6314 tons, against 4290 tons in the corresponding period of 1869. The exports of coal from Belgium in August amounted to 393,522 tons, against 278,509 tons in August, 1869; and for the first eight months of this year to 2,565,449 tons, against 2,185,392 tons in the corresponding period of 1869. France continues the principal customer of Belgium for coal, having taken 2,418,139 tons in the first eight months of this year, against 2,096,841 tons in the corresponding period of 1869. The next most important foreign market for Belgian coal is Holland, to which Belgium sent 134,000 tons in the first eight months of this year. The exports of coke from Belgium attained a total of 47,822 tons in August, against 52,263 tons in August, 1869; and in the first eight months of this year they were 471,198 tons, against 424,137 tons in the corresponding period of 1869. As regards their value, the exports of coal and coke to Aug. 31 this year exceeded the corresponding amount for the first eight months of 1869 by 269,449*l*. These figures are satisfactory enough, but the statistical experience which may be expected to be afforded by the last four months of the year can scarcely fail to be of a very different character.

The continental copper markets have generally continued quiet. Correspondence from France comes to hand rather irregularly, but it is no great matter, as all business transactions in that disordered country are in a very distracted state. At Havre, Chilian in bars has made 64*l*.; refined ditto, in ingots, 73*l*. to 74*l*.; pure Peruvian minerals, 70*l*. to 70*l*. 10s.; United States (Baltimore), 76*l*. to 78*l*.; ditto (Lake Superior), 80*l*. to 86*l*. per ton. The German markets have presented no very remarkable movement, they have been generally quiet, and without great affairs. The German tin markets have been more feeble. At Amsterdam, since the sale of the Society of Commerce, tin has been rather neglected; Banca has fallen to 71 fl., but at the last dates there was a slight revival. Disposeable Billiton has been dealt in at 71¼ fl. At Marseilles lead in saumons, first fusion, has made 18*l*. 8s.; ditto, second fusion, 17*l*.; in shot, 20*l*.; in pipes and rolled, 20*l*. 16s. per ton. The article has been generally rather firm upon the German markets. At Rotterdam, Stolberg and Eschweiler are quoted at 11 fl.; and German of various marks 10¾ fl. Zinc has been rather neglected upon the German markets.

FOREIGN MINES.

ST. JOHN DEL REY.—The directors have received the following report, dated Morro Velho, Oct 29:—Morro Velho produce, second division of October, eleven days, 2613 oits., yield 2·241 oits. per ton. This gold return is quite as good as we could expect, not having the Bahu machine to bring up the stone. The yield per ton is fair. The next division should give a better return of gold.

DON PEDRO.—Mr. F. S. Symons, Oct. 29: Sinking has progressed, though not so fast as calculated, owing to wire-rope of Dawson's machine breaking twice; it was speedily repaired, and we hope to commence the cross-cut to drain the course the latter end of next month; water has increased. The machine is at present raising 8·80 cubic feet of water per minute. Good duty accomplished at Treloar's and middle adit, and a cross-cut has been commenced from bottom of stopes to intersect Treloar's; about 27 fathoms have to be driven; when completed water will go through this in lieu of Alice's, making a difference vertically of 10 fathoms. No. 6 continues disordered, giving but poor general work, and no line defined. The general stopes have yielded ore of a low standard. Exploration on the lodes at Alice's west continues to be prosecuted with vigour; nothing rich has been encountered. Produce weighed to date, 3556 oits.; estimate for month, 4756 oits.

ANGLO-BRAZILIAN.—Mr. F. S. Symons, Oct. 29: Attendance of force has improved since my last, the lodes throughout the mine maintain their favourable size and aspect, particularly to be noted at Haymen's. Rarely have the lodes looked more promising than at present.

ROSSA GRANDE.—Mr. Ernest Hilcke, Oct. 28: Little alteration has taken place in the appearance of the lode at Mina de Serra since last reported on. The lode recently intersected at the 40 west has increased in size, and presents indications of being the commencement of the shoot from Mina do Alto. At Gongo and all other points of progress there is nothing new.

GENERAL BRAZILIAN.—Capt. T. Treloar, Oct. 28: With regard to the general operations to date nothing has occurred calling for special remark. The weather is still fine, the establishment is healthy, and the works generally are progressing well. The ground at shallow adit is still very troublesome; but though slowly, still the miners are conquering it.

TAQUARIL (Gold).—T. S. Treloar, Oct. 28: Our works generally are progressing satisfactorily. The erection of stamps is being prosecuted night and day, and the show daily made is so good that I have every reason to hope we shall be in a position to commence stamping about the middle of next month. The quantity of gold extracted since my last is insignificant. Operations upon the new shoot have been very limited, and most of the stuff taken from it, though good, would not do for hand treatment. But the fact that a rich bunch of box work has been met with in the manganese or jacotinga formation augurs well for Taquaril. Manganese has been encounterd at the deep adit also, but at this point samples so far have shown no gold. The remaining sections of the mine are without change to note.

ECLIPSE (Gold).—Capt. Barratt, Oct. 29: The tracks (railroads) in the main shaft and in the 100 feet level are completed. The shaftmen will commence to sink immediately. We have commenced to stope quartz (ore) from the back of the 100 feet level; lode 6 ft. wide. Mining operations will now be carried on without delay. The boiler makers have finished the boiler, and the engineer will soon fix it in its place. The fixing of the machinery is progressing as fast as possible.

UNITED MEXICAN.—Extracts of despatch from the commissioner, dated Guanaxuato, Oct. 21: Mine of Jesus Maria y Jose: The supply of carga from this mine for the haciendas is low both in quantity and quality; however in compensation the buscon workings have improved. The accounts for the month of September show a small profit of $150.—Mine of Remedios: This mine though the sales have declined is yielding a good quantity of carga for the haciendas, and our tortas in both haciendas have improved in ley. The extraction from the reserves can only be carried on gradually and with many precautions, the upper wall of the vein in this section of the mine being in very loose rock. The accounts for September show a profit of $6535, of which $3706 belong to the company.—New Concern—Adit of San Cayetano: The adit in the month of September advanced 7½ varas. The rock is not quite so hard as it was, and if the heat were not so great better progress might be made, but even so, I confidently expect to communicate it with the Buenos Ayres workings before the middle of February next year.—Mine of Buenos Ayres: The frente advanced in September 11½ metres. The rock continues to be favourable, and since Oct. 1 we have got on at the rate of 2 metres weekly.—Mine of San Antonio de la Ovejera: The cross-cut is now 18½ metres in, and we ought to be very near the lode. On Oct. 14 we cut a strip of quartz rock running at right angles with the cross-cut or about parallel with the lode.

TUOLUMNE (Gold).—*Telegram* from the manager at Sonora:—"Just forwarded 41 ozs. of gold." This is the result of 25 days' milling.

ALMADA AND TIRITO (Silver).—*Telegram*, dated Guaynias, Nov. 4, from Mr. Clemes:—August: Profit for month, $2160; 187 tons ore crushed in month; value of ores, $50 per ton.—September: Profit for month, $3774; 197 tons of ore crushed in month; value of ores, $48 per ton. Pitanque ore in stock, 18 tons. [The value of Pitanque ore as realised by former sales is from 80*l*. to 100*l*. per ton. July account not received.]

EXCHEQUER (Gold and Silver).—Lewis Chalmers, Oct. 31: During the week ending Saturday, the 29th instant, 7 feet were raised in the air-shaft, which is now up 143 feet. Five feet were run in the 80 ft. level, and 7 ft. in the 50. The grading for the furnace-room all but completed. Monthly report and accounts in a few days. Very busy.

PESTARENA.—Messrs. T. Roberts and Mitchell, Nov. 24: Val Toppa Mine: We have just reached the side lode in the rise above the cleavage, where it resembles in size and character the lode below this cleavage, which yielded 9 tons per fathom, worth 18 dwts. of gold per ton. We have now commenced a new drivage north from the 4th cross-cut east, in the No. 2 level to come back over this rise; the lode in the end at present yields 3 tons of ore per fathom, worth 12 dwts. per ton. The other parts of the mine are much the same as last report. —Pestarena Mines—Acquavite: The 55 fm. level end north has improved, now giving 6 tons per fathom, worth 1¼ oz. of gold per ton. No change in the 46 fm. level end south. The 23 fm. level end south yields 6 tons per fathom, worth 15 dwts. per ton.—Peschiera: The end north, on No. 2 lode, is small; the end north, on No. 5 lode, 4 tons per fathom, at 12 dwts. per ton. The winze on No. 2 lode is suspended on account of water, and we have commenced a cross-cut from No. 1 lode to come under this winze. No change in the bottom stopes.

[For remainder of Foreign Mines see to-day's Journal.]

MINING IN AUSTRALASIA—MONTHLY SUMMARY.

THE MOONTA MINE.—The directors' report sets at rest all doubts as to the productivenes of the mine, by stating that it continues to yield the usual supplies of ore, and that the financial affairs of the company are in a satisfactory condition. During six months the quantity of ore produced, independent of washings or sluices, reached 9031 tons, averaging 17¾ per cent. The value of this, estimated at 9*l*. per ton, amounts to 81,279*l*. The working expenses are set down at 62,843*l*., or 6*l*. 19s. 2d. a ton, so that there is a balance to the good of 18,436*l*., or 2*l*. a ton. The directors have entered into an agreement with the Wallaroo Company for the sale to them of the produce of the mine for the year ending August 31, 1871. Payment is to be made on the basis of the prices ruling in the English market, and the returning charges are fixed at a rate favourable to the company. One dividend of 10s. per share has this half-year been paid out of realised profits. The total quantity of ore on hand on March 20 was 5306 tons (of 21 cwts.), and since then, up to Sept. 20, 9031 tons 12 cwts. have been raised. The sales within the colony have covered 3345 tons 14 cwts.; the shipments to England, 5879 tons 14 cwts.—thus leaving 5112 tons in hand, which is estimated at 46,068*l*. No less than 21 shafts have been sunk, the deepest being 98 fathoms from surface. Even at this great depth, a very large extent of good orey ground has been opened up. The machinery is all reported in excellent order. The distribution of the company's establishment is thus given:—16 officers, 725 miners, 28 mechanics, 5 stablemen, 102 labourers, 215 boys at the mine, and two officers in Adelaide—total, 1093.

AUSTRALIAN MINES.

YUDANAMUTANA.—The directors have received advices from their superintendent, dated Adelaide, Oct. 11: He states—Since last date there has been no alteration worthy of notice, except a marked improvement in the mine, of which I give you particulars below.—Mining: The lode at the 50 remains untouched, as the water has stopped all working at this point for the present. On Sept. 18, Capt. Terrell reported that the end driving north of No. 1 winze, water level, was improving. The lode was then the end wide, rich sulphurets, with droppers coming in; and on the 25 he reported another distinct lode of sulphuret ore above the water level. He has, however, with my consent and approval, discontinued operations at this most important part of the mine, as the cost of hauling was eating up our profit, but when the downright shaft is complete we shall be enabled to make immense returns, and I doubt not excellent profit even with copper at 74*l*.—Downright's Shaft: This is now down nearly 4 fathoms.—Railway North: Matters relative thereto are progressing satisfactorily.—Capt. Terrell reports under date of Oct. 3, Blinman Mine, No. 1 winze: Since my last we have driven about 4 fathoms north, on the course of the branch, and in about 2 fathoms we cut one of the droppers, as I anticipated in my last report. The size of the branch in the back of the end is about 6 in. wide, but up from the bottom of the end, about 2 feet from water level, the lode is 2 feet wide, of solid sulphuret ore of about 30 per cent.; I believe the branch will be a good deal wider as it goes down under the water level; it is really a splendid lode of ore, and strengthens my opinion, that when we have the facilities of working below the water that they will prove as good lodes as any in the colony. Nos. 2 and 3 winzes, nothing has been done in either of these since my last. The winze south of No. 1 winze 25 fathoms, we have been sinking and stoping in this place whole of the month; this is a fine course of ore, of about 25 to 30 per cent. stopes at the 10, between No. 1 and 2 winzes, are the same as last reported New Engine-Shaft: This shaft is down about 20 ft., the ground is very hard, full of strings of ore throughout; I think the ground will change for the be in a few feet more.—Wood: We could not get any at the reduced rate, so I to give the old price, 12s. for dry, but we are only giving 9s. for green. I stopped them carting for the week, as it was coming in too fast for us. Ret from Sept. 5 to Oct. 3: Ore raised, 224 tons; ore smelted, 249; copper m 22 tons 4 cwts.

PORT PHILLIP (Gold).—Clunes, Oct. 8: The quantity of qua crushed during the four weeks ending Sept. 14 was 5228 tons; pyrites treate tons; total gold obtained, 1666 ozs. 5 dwts., or an average per ton, includ pyrites gold, of 6 dwts. 9 grs. The receipts were 6286*l*.; payments, 3252*l*.; pr 3034*l*. The debit balance brought forward from last month was 3362*l*., of wh 200*l*. has been paid in the interval by this and the Clunes Company in their spective proportions, and the balance out of the above profit, leaving an av able balance of 167*l*. The amount divided between the two companies was 12 the Port Phillip Company's proportion of which amounts to 780*l*. The bala of 47*l*. was carried forward to next month's account. The return for the th weeks ending Oct. 5 is as follows:—Quartz crushed, 3671 tons; gold obtain 1008 oz. 8 dwts.; or an average per ton, without pyrites gold, of 5 dwts. 11 Remittance, 600*l*.

The directors have received the following *Telegram*, dated Galle, Nov. 23 "Yield improved. Remittance 1400*l*."

AUSTRALIAN UNITED (Gold).—Mr. Kitto (Oct. 10) writes:— few weeks more will give us the main eastern lode in the Duke of Corn Mine, in the 230 feet level. I then expect something really good." Capt. liams reports on the Duke of Cornwall Mine to Mr. Kitto as follows:—"Dau Shaft, in the 262 cross-cut: Since last report we have cut through the big s stone, which occupied a fortnight in getting clear of it. The cross-cut was t let at 30s. per foot, and during the past week we have struck several s leaders. Should the ground continue easy, it is probable we may strike great eastern lode about the time of the next outgoing mail. Dauke's sh in the 200 feet cross-cut, has been driven 30 feet since last report. During last two days we have cut some leaders of quartz, bringing in the water strongly, leading us to conclude we are in the vicinity of a large body of qua No other change." On the Central Mine Mr. Kitto writes:—"By Capt. Ango report you will perceive that we have reached the edge of much deeper gro at the Central than we have had hitherto; nothing, of course, can be said o value at present, but I anticipate, from the quantity of water and other ind tions, that we are at last upon one of the main leads." Capt. Angove's re to Mr. Kitto, dated Oct. 10, on the Central Mine, is as under:—"I have honour to report that the western drive has been extended a further dist of 60 feet, making a total distance from the shaft of 350 feet; the ground hard for driving. On Oct. 4, two bores, at a distance of 32 ft. from each o were put up—No. 3 bore touching black clay at 22½ ft., and No. 4 bore at 3 from the back of the level; no appearance of wash in either of them, and I of opinion that we shall have to drive much further than was first calcul to reach the main lead to the west. The eastern cross-cut is now 124 feet f the shaft. At 118 feet we unexpectedly struck a heavy body of water and drift forcing their passage between a strong layer of black clay and the schi rock, the latter dipping to the east very fast, and judging from appearan should say we are unquestionably on the edge of a deep gutter; should prove to be a main run, and I cannot see otherwise, it is more than prob we shall have to extend our main bottom level, but that we may prove the d of the gutter, I should propose sinking a winze as deep as the bottom level, c to the end of the drive, and drive under it before moving the bottom level at The gutter cannot be worked from the winze, but I think its depth can be a tained. If the bottom of the winze does not reach the bottom of the gutter bottom level will prove not deep enough, which, however, I have reason to lieve will not be the case; it will be better to be certain. The south dri extended 245 ft. from the shaft; the reef rising with wash thin. In the eas drive south the water follows us in, but decreasing in quantity. The ad changing in appearance, more strong brown clay, with 2 feet wash-dirt; dipping towards us. This drive is now about 50 feet from the south d In No. 1 west block (going west) drive the dirt is thin, I have, therefore, g instructions to have the north side blocked out. In No. 2 west the dirt is a 15 in. thick, but here, too, I intend stripping out a piece before driving any ther west. To improve the ventilation I have opened a communication betw the big block drive and the air drive south of the shaft. By the end of ano week I hope to have the drive as far south as the No. 1 block, driven west, then drive at an angle to meet the south-east drive, some 70 or 80 feet ea the south drive. I hope to wash a machine daily in the ensuing week. All machinery is working well, and water sufficient for all purposes at present.

SCOTTISH AUSTRALIAN.—The directors have received advices fr Sydney, dated Oct. 7, with reports from Lambton Colliery to the 5th. The s of coal for September amounted to 15,973 tons. Capt. Holman, in reporting u date the 5th ultimo upon the operations in progress at the Cadia proper states—"We shall start the machinery on trial towards the end of next w and at the close of the second week's crushing I expect we shall have got from 30 to 40 ozs. of gold."

ENGLISH AND AUSTRALIAN (Copper).—The directors have adv from their manager, dated Port Adelaide, Oct. 12: At Port Adelaide there w about 500 tons of coal. There were four furnaces roasting and one melting work at the Port. One refinery was out for repairs, and the other would lighted in the course of a day or two. The steamer Kangaroo was discharg ore at the wharf, and the Verulam discharging coal. The Coonattoo was alo side the old wharf, and the Darra was to go alongside shortly. The last furn at the Newcastle works was nearly completed. Since date of last advices ab 158 tons of copper had been shipped.

ANGLO-AUSTRALIAN (Gold).—Captain Raisbeck, Oct. 8: "N engine-shaft has been sunk to a depth of 193 feet 6 in.; sinking is now dis tinued, owing to the influx of water being in excess of the power of raisin with economy by the present appliances, and will not be resumed until ste power can be brought to bear. The ground is much easier than it has been weeks past.—Engine and Boiler-House: The contractors have completed engine-bed; the main walls and stack, with portion of boiler-house, are 9 feet 6 in. above foundations." Mr. Kitto writes:—"The whole of the wo in connection with the above company's operations are being carried on satisfactorily; and we expect, if the weather is favourable, to see the eng at work by Christmas. You will see, from the captain's report, that an ea start is all the more to be desired, seeing that the late floods have caused sinking operations to be suspended."

GOLD MINING IN NEW ZEALAND.—The half-yearly returns sh that the gold-producing industry continues in a fairly prosperous conditi The yield of gold from the whole colony shows a falling off since last year, not to any serious extent. The province of Otago has not shared in the di nution, the exports for the first half of the current year showing a slight crease over those of the same period in 1869. The falling off has been confi to the West Coast and the Thames, the latter showing the most considera lapse. The total export for the half-year was a little over 280,000 ozs., of wh 19 per cent. is from Auckland, and the rest, in nearly equal quantities, fr Nelson, Westland, and Otago, the latter taking the lead again for the first t for some years. The settlement of a body of Chinese miners in this province done much to keep up the steady yield of the past three years.

SPECIAL TRADES' DIRECTORIES.

Applications are so frequent both from purchasers and others f list of the manufacturers or tradesmen connected with some par cular branch of industry in all parts of the kingdom that the iss by Messrs. KELLY and Co. of the first two of a series of special trad directories cannot but be regarded as calculated to supply a long-fe want. To the readers of the *Mining Journal* the "Post Office Dire tory of the Engineers and Iron and Metal Trades" will be found i valuable, and by utilising it many of them will be able to reimburse themsel ten times the amount in a single year. The advantage of purchasing by ten has for some time past been recognised by public companies, and it is almost only means by which shareholders can ascertain whether the orders are giv out by their officers in consideration for the interest of the company or for t of individuals, and there is, perhaps, nothing that offers greater facilities obtaining a large number of tenders than a good trades' directory embrac the entire country. Suppose, for example, a second-hand machine is requi a notice of the want could readily be forwarded to the various machinery brok and dealers, and no fear need be entertained that one or other of them will able to supply it. In many cases Messrs. Kelly even state the particular cl of machinery to which the dealer gives special attention: thus one is descri as a dealer in agricultural machinery, and another as trading chiefly in "sl and screw cutting lathes; slotting, drilling, shaping, and planing machin steam-engines; also value of tools;" and the same in every other branch manufacture. Another case in which the new directories will prove very use is that of the sellers of some new machine or product to be used in connect with an industry carried on chiefly in a particular district. By turning to portion of the directory devoted to the lists of places they can at once put the selves into communication with all who are likely to supply that industr Take, for example, machine oil; the manufacturer of anything new and super in that direction could at once communicate with all likely to deal in it in (sa the Manchester and Leeds district, or any others in which they may consi there is an opening for business; and as the directory embraces every trade a profession in any way connected with the trades to which the directory exte more complete information need not be desired.

The "Post Office Directory of the Building Trades" will prove of similar u lity in another direction, for as it comprises every trade and profession c nected with the architectural and building trades it may be availed of by ma of those connected with the metal trade, in order to take increased advant of the continually growing disposition to employ metal in connection with constructive arts. The works being confined to a single class of trades, facili are offered for the division of the various branches of each particular trade an extent that in a general directory is practically impossible. In the Build Trades the manufacturers of every article used in the trade is given, and in Engineering Trades the manufacturers of the several classes of machines be ing a general name are carefully separated from each other; thus, steam-eng makers are classified according as the engines they manufacture are employ for ploughing, portable, or traction purposes, whilst steam-hammer makers makers of steam-road rollers likewise form distinct lists. The character general accuracy of Messrs. Kelly and Co.'s directories are too well known to quire lengthened commendation from us; but with regard to the Metal Tra Directory, with the majority of the names in which we are necessarily well quainted, we may state that we have referred to many of them without di vering any inaccuracy either in the addresses or description; and that volumes are in every respect equal to the numerous Post Office Directories wh Messrs. Kelly have previously issued.

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